9.4.5 Case Study, The Thermal Test Facility, National Renewable Energy Laboratory, Golden, Colorado (Office/Laboratory)

Building Design

Floor Area:	10,000 SF	Floors (1):	2	Aspect Ratio:	1.75
Offices	Laboratories	Conference Room		Mechanical Level	

Shell

Windows

	Material	U-factor	SHGC (2)
Viewing Windows:	Double Pane, Grey Tint, Low-e	0.42	0.44
Clerestory Windows:	Double Pane, Clear, Low-e	0.45	0.65

	Window Area(SF)
North	38
South(3)	1134
East	56
West	56

Wall/Roof

	Material	Effective R-Value
North Wall	Concrete Slab/Rigid Polystyrene	5.0
South/East/West	Steel Studs/Batt Insulation/Concrete	23.0
Roof:	Built-up/Polyisocianurate Covering/Steel Supports	23.0

HVAC

VAV air handling unit
Hot water supply paralell VAV boxes
Direct and Indirect evaporative cooling system
Single zone roof top unit (4)
Hot Water Coil (4)

Lighting Power Densities (W/SF)

Interior Overhead	0.73	Exterior	0.05
Emergency	0.02	Building	0.80

Energy/Power

Net Annual Energy Usage (thousand Btu/SF*year): 23.02

Note(s): 1) That second floor is actually and mechanical mezzaine level. 2) Solar heat gain coefficient 3) Includes 492 SF of viewing windows and 642 SF of clerestory windows. 4) Only used to handle the conference room.

Source(s): NREL, Evaluation of the Energy Performance and Design Process of the Thermal Test Facility at the National Renewable Energy Laboratory, February 2005, p. 29-54; NREL, Lessons Learned from Case Studies of Six High-Performance Buildings, June 2006, p. 5 Table A-2 p. 130.